COUPLING AN ELECTRONIC SKIN TATTOO TO A MOBILE COMMUNICATION DEVICE

F THE DISCLOSURE

[0001] The present disclosure relates generally to acoustic noise for a mobile communication device and more particularly to reducing acoustic noise with an auxiliary voice input.

BACKGROUND

[0002] Mobile communication devices are often operated in noisy environments. For example, large stadiums, busy streets, restaurants, and emergency situations can be extremely loud and include varying frequencies of acoustic noise. Communication can reasonably be improved and even enhanced with a method and system for reducing the acoustic noise in such environments and contexts.

BRIEF DESCRIPTION OF THE FIGURES

[0003] The accompanying figures, where like reference numerals refer to identical or functionally similar elements throughout the separate views, together with the detailed description below, are incorporated in and form part of the specification, and serve to further illustrate embodiments of concepts that include the claimed invention, and explain various principles and advantages of those embodiments.

[0004] FIG. **1** is a block diagram of an example system in accordance with one or more embodiments.

[0005] FIG. **2** is a block diagram of an example electronic skin tattoo in accordance with some embodiments.

[0006] FIG. **3** is an example illustration of the adherence of the electronic skin tattoo to a throat region of a body.

[0007] FIG. **4** is an example flowchart for a method according to one or more embodiments.

[0008] FIG. **5** is an example flowchart for another method according to one or more embodiments.

[0009] Skilled artisans will appreciate that elements in the figures are illustrated for simplicity and clarity and have not necessarily been drawn to scale. For example, the dimensions of some of the elements in the figures may be exaggerated relative to other elements to help to improve understanding of embodiments of the present invention.

[0010] The apparatus and method components have been represented where appropriate by conventional symbols in the drawings, showing only those specific details that are pertinent to understanding the embodiments of the present invention so as not to obscure the disclosure with details that will be readily apparent to those of ordinary skill in the art having the benefit of the description herein.

DETAILED DESCRIPTION

[0011] A system is described herein for providing auxiliary voice input to a mobile communication device, also sometimes referred to a mobile computing device as well and hereinafter termed, "MCD". The system comprises an electronic skin tattoo capable of being applied to a throat region of a body. The electronic skin tattoo can include an embedded microphone; a transceiver for enabling wireless communication with the MCD; and a power supply configured to receive energizing signals from a personal area network associated with the MCD. A controller is communicatively coupled to the power supply. The controller can be configured to receive a signal from the MCD to initiate reception of an audio stream picked up from the throat region of the body for subsequent audio detection by the MCD under an improved signal-to-noise ratio than without the employment of the electronic skin tattoo.

[0012] FIG. **1** is a block diagram of an example system **100** comprising an electronic tattoo **110** and a mobile communication device (MCD) **120** that are communicatively coupled. Electronic tattoo **110**, which can be applied to a region of the body via an adhesive, is further comprised of a controller **101**, a personal area network (PAN) transceiver **102**, audio circuitry **103**, a power supply **104**, and a signal processor **105**.

[0013] Controller **101** of electronic tattoo **110** can be configured to execute programs or instructions to enable communicative coupling of the electronic tattoo to external electronic devices such as a smartphone, a gaming device, a tablet computer, a wearable computer, for example. Controller **101** also controls signaling that occurs internal to the circuitry of the electronic tattoo **110**. PAN transceiver **102** can be further comprised of a discrete transmitter and receiver (not shown). PAN transceiver **102** can comprise circuitry configured to receive near field communication signals (NFC), Bluetooth® signals, and Zigbee® signals or other contemplated close proximity communication protocols. These signals can be emanated from a personal area network associated with the MCD **120**. Accordingly, the MCD **120** will also be equipped with close range communication technology such as NFC, Bluetooth®, and Zigbee®. As used herein, the term close proximity communication means wireless communication between at least two devices over a short distance, for example, less than 10 meters, less than 5 meters less than 2 meters, less than 10 centimeters, less than 5 centimeters, less than 2 centimeters, or less than 1 centimeter.

[0014] Regarding the NFC protocol as a close proximity communication protocol, the NFC protocol can be specified in accordance with radio frequency identification (RFID) standards including, but not limited to, ISO/IEC 1443, ISO/IEC 18092 (e.g., with Manchester coding at 212 kbit/s in the 13.56 MHz range), and FeliCa.

[0015] Other examples of close proximity protocols are wireless infrared (IR) communication protocols. Still other close proximity protocols can be used and the embodiments described herein are not limited in this regard.

[0016] The electronic tattoo **110** can comprise audio circuitry **103** that enables reception of acoustic signals from a person's throat when the electronic tattoo **110** is applied to a throat region of a body. Here it is contemplated that the electronic tattoo **110** can also be applied to an animal as well. Audio circuitry **103** can also include a microphone for emitting sound corresponding to fluctuations of muscle or tissue in the throat.

[0017] A power supply **104** for the electronic tattoo **110** can be configured to receive energizing signals from external sources, including a personal area network employing NFC, Bluetooth®, or Zigbee® technology. The power supply **104** can also simply be a battery that may or may not be rechargeable. Power supply **104** is also communicatively coupled to controller **101** of the electronic tattoo **110** for receiving initialization signals to begin a charging sequence, for example. The power supply **104** can also receive electrical energy from PAN transceiver **102** that can specifically comprise an NFC transceiver, a Bluetooth® transceiver, or a Zigbee® transceiver.

[0018] A signal processor **105** can be employed by electronic tattoo **110** for reducing signal-to-noise ratios of audible sound emanating from a throat and picked up by audio cir-